

In the Claims

~~1-39.~~ (Canceled)

40. (New) A method for encrypting a plaintext message to produce a cyphertext message, based on a symmetric cryptographic key, the method comprising:

(a) providing a shared key as a graph, expressed in a computer-readable storage medium, wherein:

the graph comprises a plurality of vertices interconnected by a plurality of edges, whereby each edge connects two vertices, such that it is possible to travel from any one of the vertices to any other one of the vertices by following one or more of the edges;

each of the plurality of vertices is identified by a letter from a first alphabet; and

each of the plurality of edges is identified by a letter from a second alphabet, such that no two edges which connect to the same vertex are marked by the same letter;

(b) providing the plaintext message in the first alphabet, where the alphabet is comprised of  $n$  letters, and where the provided plaintext message is constructed as follows:

(b.1) the original plain language message comprised of the English or other human language alphabet, plus digits and punctuation marks, is expressed via a look-up table through an alphabet comprised of  $(n-1)$  letters, and

(b.2) where the plaintext sequence expressed via the  $(n-1)$  alphabet is processed by interposing an  $n$ -th letter between any two letters in the sequence where a letter follows the same letter, thereby creating a plaintext sequence expressed through an  $n$ -letter alphabet, and that sequence is free from occurrences where a letter follows the same letter;

(c) traversing the graph along its edges in accordance with the plaintext message provided in the first alphabet to cover an ordered set of the vertices, the ordered set of the vertices corresponding

to the order of the letters of the first alphabet in the plaintext message, wherein a pathway taken among the ordered set of the vertices defines an ordered set of the edges; and where the first vertex in the ordered set of vertices is preset, and is part of the encryption procedure, and where any vertex and any edge can be revisited more than once in the pathway, and some vertices and some edges may not be part of the path at all;

(d) forming an ordered set of letters of the second alphabet corresponding to the ordered set of the edges; and

(e) taking the ordered set of letters of the second alphabet as the cyphertext message.

2.  
41. (New) A method for encrypting a plaintext message to produce a cyphertext message, based on a symmetric cryptographic key, the method comprising:

(a) providing a shared key as a graph expressed in a computer-readable storage medium, wherein:

the graph comprises a plurality of vertices configured on a two-dimensional lattice, like squares of a chessboard, where the vertices which are not on the outside perimeter of the lattice, are connected to their four neighbors, one upward, one downward, one leftward, and one rightward, with four corresponding edges, and where vertices in the lattice which do not have a neighboring vertex because they are at the outside perimeter of the lattice, have only edges to their existing neighbors;

it is possible to travel from any one of the vertices to any other one of the vertices by traveling along one or more of the edges;

each of the plurality of vertices is identified by a letter from a first alphabet of four letters; (X,Y,Z,W) and

each of the plurality of edges is identified by a letter from a second alphabet of four letters (U,D,R,L);

(b) translating the plaintext message into the first alphabet such that the translated plaintext message uses only three letters of the first alphabet, (X,Y,Z);

(c) in the translated plaintext message, whenever a letter in the sequence follows the same letter, (e.g. XX), interposing the fourth letter, (W), (e.g. XX→XWX), of the first alphabet, to produce a translated and converted plaintext message in which no letter in the plaintext sequence follows the same letter;

31  
(d) traversing the graph along its edges in accordance with the plaintext message provided in the first alphabet to cover an ordered set of the vertices, the ordered set of the vertices corresponding to the order of the letters of the first alphabet in the plaintext message, wherein a path taken among the ordered set of the vertices defines an ordered set of the edges;

(e) forming an ordered set of letters of the second alphabet corresponding to the ordered set of the edges; and

(f) taking the ordered set of letters of the second alphabet as the cyphertext message.

3.  
~~42.~~ (NEW) The method of claim ~~40~~<sup>1</sup>, wherein the vertices in the graph are marked with letters of the first alphabet such that each letter of the alphabet is marked on at least one vertex.

4.  
~~43.~~ (NEW) The method of claim ~~41~~<sup>2</sup>, wherein the vertices in the graph are marked with letters of the first alphabet such that each letter of the alphabet is marked on at least one vertex.

5.  
~~44.~~ (NEW) The method of claim ~~40~~<sup>3</sup>, wherein all the vertices in the graph are marked with letters of the first alphabet such that from each vertex, ("the reference vertex"), there is a pathway, (a sequence of edges), ending with a vertex marked by another letter of the first alphabet, and where all the vertices in the pathway, except the last one, are marked with the same letter as the first vertex, (the reference vertex); and this property will be satisfied for each vertex in the graph, and for each vertex,

in its turn as a reference vertex, this property will be satisfied with respect to all other letters of the first alphabet, except the one that marks the reference vertex.

11  
45. (NEW) The method of claim <sup>6</sup>~~41~~<sup>2</sup>, wherein all the vertices in the graph are marked with letters of the first alphabet such that from each vertex, ("the reference vertex"), there is a pathway, (a sequence of edges), ending with a vertex marked by another letter of the first alphabet, and where all the vertices in the pathway, except the last one, are marked with the same letter as the first vertex, (the reference vertex); and this property will be satisfied for each vertex in the graph, and for each vertex, in its turn as a reference vertex, this property will be satisfied with respect to all other letters of the first alphabet, except the one that marks the reference vertex.

7  
46. (NEW) A method of decrypting a ciphertext created according to method 40 whereby the sequence of letters of the second alphabet which is expressed in the ciphertext is used to retrace the pathway which was charted in said method, by starting the pathway at the preset initial vertex which was used in said method, choosing the edge connected to this initial vertex according to the first letter of the ciphertext, and thus identifying the next vertex in the pathway; continuing the pathway by selecting the edge identified by the second letter of the ciphertext, and thus identifying the second vertex of the pathway; continuing to so identify each successive vertex in the pathway by selecting from each identified vertex, the next edge according to the next letter of the ciphertext, so continuing until the ciphertext letters are exhausted, at which point, the identified vertex of the pathway are the same vertices in the same order as the ones assembled in said method, and the letters of the first alphabet that mark the identified vertices of the pathway, comprise a sequence which is undergoing a procedure by which all sequences of letters where one letter follows the same letter, are removed, and replaced by a single letter, the same as the letter of the removed sequence, thereby the remaining

sequence is free from any occurrence whereby one letter follows the same letter; removing the n-th letter from the sequence, and thereby regenerating the plaintext sequence.

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